

Donald Abelson
Chief of the International Bureau
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

Dear Mr. Abelson:

The National Telecommunications and Information Administration on behalf of the Executive Branch Agencies, has approved the release of two additional Draft Executive Branch (NTIA) proposals considering federal agency inputs toward the development of U.S. Proposals for WRC-03.

Your WRC-03 Advisory Committee drafted these proposals that address agenda items 1.6 and 1.25. The proposal for agenda item 1.6 addresses regulatory measures to protect feeder uplinks of non-GSO mobile satellite service systems, operating in the fixed satellite service from interference by Radio Local Area Networks (RLANs) and other license exempt applications. The proposal for agenda item 1.25 addresses the identification of appropriate frequency bands for high-density applications in the FSS, and the adoption of approved national guidelines to facilitate the deployment of HDFSS earth terminals.

We have made several changes to the original Advisory Committee documents, which we are forwarding for your consideration and review by the WRC-03 Advisory Committee. Jim Vorhies from my staff will contact Alexander Roytblat and reconcile any differences.

Sincerely,

(Signed February 13, 2002)
William T. Hatch
Associate Administrator
Office of Spectrum Management

Enclosures

United States of America
PROPOSALS FOR THE WORK OF THE CONFERENCE

~~WRC-2003 Advisory Committee~~

IWG-2

Draft USA Proposal on WRC-03 Agenda Item 1.6

Agenda Item 1.6: to consider regulatory measures to protect feeder links (Earth-to-space) for the mobile satellite service, which operate in the band 5_150-5_250 MHz, taking into account the latest ITU-R Recommendations (for example, Recommendations ITU-R S.1426, ITU-R S.1427 and ITU-R M.1454);

Background Information: The proliferation of transmitters in the ~~F~~ixed and ~~M~~mobile ~~S~~services providing applications such as Radio Local Area Networks (RLANs) and other license exempt applications could cause interference to the feeder uplinks of non-GSO ~~M~~mobile ~~S~~satellite ~~S~~service systems, operating in the ~~F~~ixed ~~S~~satellite ~~S~~service. Regulatory measures must be considered to protect these links from interference.

The band 5_150-5_250 MHz is allocated on a primary basis to the FSS and its use is limited to non-GSO MSS feeder links by footnote ~~S5.447A~~. This band is also allocated by footnote ~~S5.447~~ to the mobile service (MS) on a co-primary basis in 27 countries in Regions 1 and 3 subject to ~~S9.21~~. Administrations are currently considering the introduction of ~~F~~ixed and ~~M~~mobile ~~S~~services in the band 5_150-5_250 MHz on a national and ~~unlicensed exempt, uncoordinated~~ basis without a requirement to coordinate their usage with other services in the band (see Recommendation ITU-R M.1454).

At WRC-2000, Resolution 1156 called for studies by the ITU-R leading to technical and operational recommendations to facilitate sharing between existing services and ~~F~~ixed and ~~M~~mobile ~~S~~services, including RLANs in the bands 5_150-5_350 MHz and 5_470-5_725 MHz. ~~It is anticipated that T~~these studies ~~will provide assurance~~ show that allocation to ~~F~~ixed and ~~M~~mobile ~~S~~services, in these bands 5_150-5_250 MHz, can co-exist with incumbent non-GSO MSS feeder links and ~~A~~aeronautical ~~R~~adionavigation ~~S~~service systems.

During the 1998-2000 study period, ~~considerable time and effort was spent on the development of~~ three ITU-R Recommendations addressing this topic were approved.

~~JRG-8A-9B developed~~ Recommendation ITU-R M.1454 entitled "EIRP Density Limit and Operational Restrictions for RLANs or Other Wireless Access Transmitters in order to Ensure the Protection of Feeder Links of Non-Geostationary Systems in the Mobile Satellite Service in the Frequency Band 5_150-5_250 MHz." ~~This Recommendation~~ calls for implementers of wireless access systems to limit the EIRP density of such transmitters to 10mW in any 1 MHz, operate these transmitters only indoors

and ensure that the aggregate emissions of these transmitters do not exceed the power flux density limit given in Recommendation ITU-R S.1426.

~~Working Party 4A also considered~~ The protection of MSS Feeder Links from wireless access system emissions ~~and created~~ is treated in two Recommendations ~~in response to these studies.~~; Recommendation ITU-R S.1426, entitled "Aggregate Power Flux Density Limits at the FSS Satellite Orbit for Radio Local Area Network (RLAN) Transmitters Operating in the 5 150-5 250 MHz Band Sharing Frequencies with the FSS (RR No. **S5.447A**)" imposes an aggregate power flux density limit on ~~F~~fixed and ~~M~~mobile ~~S~~services equal to:

$$-124 - 20 \log_{10} (h_{\text{sat}} / 1414) \text{ dB(W/(m}^2 \text{ per 1 MHz))}$$

where h_{sat} is the altitude of the spacecraft in kilometers. This limit is for the protection of FSS satellites using full earth coverage receive antenna beams.

Further, ~~WP 4A created~~ Recommendation ITU-R S.1427, ~~entitled~~ "Methodology and Criterion to Assess Interference from Radio Local Area Network (RLAN) Transmitters to Non-GSO MSS Feeder Links in the Band 5_150-5_250 MHz." ~~This Recommendation specified~~ specifies that interference from RLAN transmitters should be assessed on the basis of an increase in ΔT_{sat} , the satellite receiver noise temperature, and, to ensure protection, this increase should be no greater than 3%. A Note to the Recommendation ~~indicated~~ indicates that the interference absorbed by the satellite system should not lead to a reduction in capacity of more than 1%.

Unconstrained deployment of ~~F~~fixed and ~~M~~mobile ~~S~~service applications could cause unacceptable levels of interference into the feeder uplinks of the non-GSO MSS. Appreciating this fact, WRC-2000 developed agenda item 1.6 for WRC-2003, which calls for the consideration of regulatory measures to protect the FSS (Earth-to-space) allocation in the band 5_150-5_250 MHz from RLAN interference.

Proposal:

USA/ /1
ADD

S5.447x In order to protect the non-GSO MSS feeder links (Earth-to-space) in 5 150-5 250 MHz from interference caused by devices ~~operating in this band, in the fixed and mobile services and those stations operating under No.5.447, other than stations of the aeronautical radionavigation, radiodetermination-satellite and fixed-satellite services,~~ the following measures shall be taken:

- i) these devices shall be limited to a maximum average e.i.r.p. of 23 dBm and maximum average e.i.r.p. ~~spectral density~~ of 10 dBm in any 1 MHz;
- ii) these devices shall be limited to indoor applications only;
- iii) for signals with an occupied bandwidth less than or equal to 1 MHz, the e.i.r.p. ~~spectral density~~ in the occupied bandwidth B shall not exceed $10 + 10\log_{10}(B) \text{ dBm. (dBm / B MHz), where B is the occupied bandwidth in MHz;}$

Reasons: To provide reasonable regulatory measures for the protection of MSS feeder links (Earth-to-space) from interference from ~~Mobile and Fixed Service devices transmitters transmitting in the band~~ while not unduly burdening the growth of those services.

USA/ /2
ADD

S5.447y Administrations should take into account the provisions of Recommendation ITU-R S.1426 for the protection of non-GSO MSS feeder links (Earth-to-space) in the 5_150-5_250 MHz band.

Reasons: To provide reasonable regulatory measures for the protection of MSS feeder links (Earth-to-space) from interference from ~~Mobile and Fixed Service devices transmitters transmitting in the band~~ while not unduly burdening the growth of those services.

USA/ /3
MOD

4 800-5 830 MHz				
Allocation to services				
Region 1		Region 2		Region 3

5 150-5 250		AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE SERVICE (Earth-to-space) S5.447A S5.446 S5.447 S5.447B S5.447C ADD <u>S5.447x</u> ADD <u>S5.447y</u>		

Reasons: Consequential

WRC-2003 Advisory Committee

IWG-4

**Draft U.S. Proposal on
~~WRC-03 Agenda Item 1.25~~**

United States of America

DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda Item 1.25: to consider, with a view to global harmonization to the greatest extent possible, having due regard to not constraining the development of other services, and in particular of the fixed service and the broadcasting-satellite service, regulatory provisions and possible identification of spectrum for high-density systems in the fixed-satellite service above 17.3 GHz, focusing particularly on frequency bands above 19.7 GHz;

Background information

The demand for broadband services is increasing. Market research predicts substantial growth in demand for broadband multi-media access, both for residential and business applications. Satellite systems offer an attractive competitive alternative to terrestrial communication systems for providing such access.

High-density systems in the fixed-satellite service (HDFSS systems) may use any orbital type (GSO or non-GSO) consistent with the FSS allocation. As envisioned in technical and operational studies, HDFSS systems incorporate small, ubiquitous, low-cost earth stations that can be deployed rapidly and flexibly. As a consequence of these general characteristics, it is not practicable to coordinate HDFSS earth stations with terrestrial services on an individual, site-by-site basis.

Preparatory studies for this agenda item addressed sharing with other services so as not to constrain their development. While sharing between Fixed Service (FS) stations and non-ubiquitous FSS earth stations can typically be handled through proven case-by-case coordination procedures, the most effective use of the spectrum within a given country where high-density deployments of FSS stations are involved may be achieved by deploying HDFSS and FS systems separately. This enables both types of systems to provide the most efficient, least constrained, highest quality and lowest cost service to the greatest number of users.

Effective HDFSS earth station deployment is very difficult to achieve when site-by-site coordination between FS stations and HDFSS earth stations is required. Therefore, it is appropriate for administrations to authorize HDFSS earth stations under a regime whereby a large number of earth stations can be deployed without the need for individual earth station site coordination. This would not relieve an HDFSS network from the ITU requirements to coordinate with fixed service networks on a site-by-site basis, where required, across international borders.

A number of FSS systems with other characteristics, and with earth stations of types other than those used by HDFSS systems, have already been brought into use, or are planned to be brought into use, including some that use the 17.8–21.2 GHz (space-to-Earth) frequency band. Accordingly, it is essential that existing FSS allocations be retained and that non-HDFSS use of these FSS allocations not be subject to additional regulatory constraints in the Radio Regulations as a result of the HDFSS band identification. Further, identification of spectrum for HDFSS does not relieve an HDFSS network of the ITU requirement to coordinate with other satellite networks.

Consideration of candidate frequency bands for HDFSS identification

A number of frequency bands allocated to the fixed-satellite service are seen as good candidates for HDFSS identification. The 29.5–30.0 GHz and 19.7–20.2 GHz bands are allocated globally to the FSS in the Earth-to-space and space-to-Earth directions, respectively. Since there are no co-primary fixed service allocations in the ITU Table of Frequency Allocations in these bands, a major sharing issue is avoided.

The 28.6–29.1 GHz and 18.8–19.3 GHz frequency bands are allocated globally to the FSS in the Earth-to-space and space-to-Earth directions, respectively. These are the only bands considered for HDFSS where NGSO FSS systems are not subject to No. S22.2 of the Radio Regulations, and therefore represent the best opportunity for ubiquitously deployed NGSO FSS user terminals. In these two bands, some administrations in all Regions have planned for HDFSS and have adopted regulatory provisions for terrestrial systems in order to facilitate HDFSS. Some HDFSS systems are already in development in these bands and there are other filings for HDFSS-type systems.

Many administrations are also planning to use the 18.58–18.8 GHz (space-to-Earth) band and the 28.35–28.6 GHz and 29.25–29.5 GHz (Earth-to-space) bands for HDFSS applications. In the 18.6–18.8 GHz band, the FSS allocation is co-primary with the Earth exploration-satellite service (passive) with restrictions on power and orbit types as described in S5.522A and S5.522B.

Between 37.5 and 50.2 GHz, many administrations have submitted ITU filings for FSS systems in the 40.0–42.0 GHz (space-to-Earth) and 48.2–50.2 GHz (Earth-to-space) bands and propose to use these bands for global HDFSS. WRC-2000 advised administrations that may be contemplating the use of the 40.5–42 GHz band for high-density applications in the fixed service (HDFS) to take into account constraints to HDFS due to the potential deployment of high-density applications in the FSS. Further, Resolution 84 (WRC-2000) urges administrations considering regulatory provisions relating to the 40.0–40.5 GHz band to take into account that there were a number of proposals to WRC-2000 to identify the band for HDFSS applications. As a consequence of actions at WRC-2000, identification of the 40.5–42.0 GHz band for HDFSS requires modification of No. S5.547 of the Radio Regulations.

It is inappropriate to add or remove any fixed-satellite service allocations in the Table of Frequency Allocations under WRC-03 agenda item 1.25. This includes new FSS allocations in bands in which the fixed-satellite service is already allocated in another direction. In particular, new space-to-Earth FSS allocations in the 17.3–17.7 GHz, 21.4–22 GHz and 47.2–50.2 GHz bands, which have been discussed in working party meetings, should be rejected. Studies have shown that the latter band is not suitable for space-to-Earth links because of likely interference with both FSS gateway and HDFSS uplinks.

Description of proposal

This proposal identifies spectrum above 18.58 GHz for high-density systems in the fixed-satellite service without constraining the use of these bands by other FSS applications or other co-primary services. It specifically does not establish priority among the different uses of these bands. The proposal consists of a new footnote **S5.[HDFSS]** to frequency bands identified for high-density FSS

systems, consequential modifications to existing footnote S5.547, and a new Resolution [HDFSS] providing guidance to administrations wishing to amend their national rules to implement high-density systems in the fixed-satellite service.

This proposal addresses WRC 2003 agenda item 1.25 concerning high density applications in the Fixed Satellite Service (HDFSS). The fundamental task requested of WRC 2003 by WRC 2000 concerning agenda item 1.25 is the consideration of regulatory provisions and identification of specific fixed-satellite service (FSS) bands to facilitate high density applications in the FSS (HDFSS). With that objective in mind, the following USA proposal to WRC 2003 has been developed to identify some specific FSS frequency bands that are particularly appropriate for HDFSS use through addition of a footnote in Article S5 of the Radio Regulations that also refers to a WRC 03 Resolution describing guidelines for administrations in implementing HDFSS.

The demand for broadband services is increasing. Leading market research groups project substantial growth in broadband multi-media satellite access. This growth is projected for both residential and business purposes. Provision of broadband services by satellites provides an attractive competitive alternative to terrestrial communication systems. Satellite systems typically require a much longer lead time than do terrestrial systems to develop and implement; therefore, some regulatory assurances that terminal deployment will be commercially viable are essential.

A High Density application in the Fixed Satellite Service (HDFSS) is one that operates on a system in the FSS, deploying a large number of small earth stations. Satellite systems can be of any orbital type, as GSO or non-GSO, and using any of the available technologies.

High Density FSS applications are generally characterized as follows:

- flexible, rapid and ubiquitous deployment of earth stations (terminals);
- highly efficient frequency reuse;
- small terminal antenna size;
- low cost terminals.

As a consequence of these general characteristics, it is not practicable to coordinate HDFSS earth stations on an individual site-by-site basis. Because of the large number and nature of terminals involved, regulations should not be imposed that would subject HDFSS earth stations to major cost and complexity implications.

Sharing between Fixed Service (FS) stations and non-ubiquitous FSS earth stations typically can be handled through case-by-case coordination procedures, which have already proved to work successfully. Where high-density deployments of FSS stations are involved, the most effective use of the spectrum within a given country can may be achieved by deploying HDFSS and FS systems in separate spectrum. This enables both types of systems to provide the most efficient, least constrained, highest quality and lowest cost service to the greatest number of users.

Effective HDFSS earth station deployment is very difficult to achieve when site-by-site coordination between FS stations and HDFSS earth stations is required. Therefore, it is appropriate for administrations to authorize HDFSS earth stations under a set of guidelines whereby a large number of

~~earth stations can be deployed without the need for individual earth station site coordination. This would not relieve an HDFSS network from the ITU requirements to coordinate with FS networks, where required, across international borders.~~

~~The U.S. does not support the removal or addition of any allocations in the existing International Table of Frequency Allocations under WRC 03 agenda item 1.25. Specifically, the U.S. does not support identification of any bands for HDFSS that are not currently allocated to the FSS, in the indicated direction, such as the bands 17.3-17.7 GHz (space-to-Earth), 21.4-22 GHz (space-to-Earth), and 47.2-50.2 GHz (space-to-Earth).~~

~~With respect to sharing within the FSS, identification of spectrum for HDFSS does not eliminate the need for coordination between satellite networks or require the imposition, in the ITU Radio Regulations, of additional regulatory constraints on the FSS, (i.e., the current rights of GSO and non-GSO FSS systems should be maintained).~~

Proposal:

USA/ / 1

MOD

18.4-20.2 GHz		
Allocation to services		
Region 1	Region 2	Region 3
18.4–18.6	FIXED FIXED-SATELLITE (space-to-Earth) S5.484A MOBILE ADD S5.[HDFSS]	
18.6–18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) S5.522B MOBILE except aeronautical mobile Space research (passive) S5.522A S5.522C ADD S5.[HDFSS]	18.6–18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) S5.522B MOBILE except aeronautical mobile SPACE RESEARCH (passive) S5.522A ADD S5.[HDFSS]	18.6–18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) S5.522B MOBILE except aeronautical mobile Space research (passive) S5.522A S5.522 ADD S5.[HDFSS]
18.8–19.3	FIXED FIXED-SATELLITE (space-to-Earth) S5.523A MOBILE ADD S5.[HDFSS]	
19.7–20.1 FIXED-SATELLITE (space-to-Earth) S5.484A	19.7–20.1 FIXED SATELLITE (space-to-Earth) S5.484A	19.7–20.1 FIXED SATELLITE (space-to-Earth) S5.484A

Mobile-satellite (space-to-Earth) S5.524 <u>ADD S5.[HDFSS]</u>	MOBILE-SATELLITE (space-to-Earth) S5.524 S5.525 S5.526 S5.527 S5.528 S5.529 <u>ADD S5.[HDFSS]</u>	Mobile-satellite (space-to-Earth) S5.524 <u>ADD S5.[HDFSS]</u>
20.1-20.2	FIXED SATELLITE (space-to-Earth) S5.484A MOBILE SATELLITE (space-to-Earth) S5.524 S5.525 S5.526 S5.527 S5.528 <u>ADD S5.[HDFSS]</u>	

27.5–30.0 GHz		
Allocation to Services		
Region 1	Region 2	Region 3
27.5–28.5	FIXED S5.5SSS FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 MOBILE S5.538 S5.540 <u>ADD S5.[HDFSS]</u>	
28.5–29.1	FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.523A S5.539 MOBILE Earth exploration-satellite (Earth-to-space) S5.541 S5.540 <u>ADD S5.[HDFSS]</u>	
29.1–29.5	FIXED FIXED-SATELLITE (Earth-to-space) S5.523C S5.523E S5.535A S5.539 S5.541A MOBILE Earth exploration-satellite (Earth-to-space) S5.541 S5.540 <u>ADD S5.[HDFSS]</u>	
29.5–29.9 FIXED SATELLITE (Earth-to-space) S5.484A S5.539 Earth exploration-satellite (Earth-to-space) S5.541 Mobile-satellite (Earth-to-space) S5.540 S5.542 <u>ADD S5.[HDFSS]</u>	29.5–29.9 FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) S5.541 S5.525 S5.526 S5.527 S5.529 S5.540 S5.542 <u>ADD S5.[HDFSS]</u>	29.5–29.9 FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 Earth exploration-satellite (Earth-to-space) S5.541 Mobile-satellite (Earth-to-space) S5.540 S5.542 <u>ADD S5.[HDFSS]</u>
29.9–30.0	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) S5.541 S5.543 S5.525 S5.526 S5.527 S5.538 S5.540 S5.542 <u>ADD S5.[HDFSS]</u>	

40.0–42.0 GHz		
Allocation to Services		
Region 1	Region 2	Region 3
40-40.5	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth) <u>ADD S5.[HDFSS]</u>	
40.5–41 FIXED FIXED SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile <u>MOD</u> S5.547 <u>ADD S5.[HDFSS]</u>	40.5–41 FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile Mobile-satellite (space-to-Earth) <u>MOD</u> S5.547 <u>ADD S5.[HDFSS]</u>	40.5–41 FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile <u>MOD</u> S5.547 <u>ADD S5.[HDFSS]</u>
41-42 FIXED FIXED SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile <u>MOD</u> S5.547 S5.551G <u>ADD S5.[HDFSS]</u>	41-42 FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile <u>MOD</u> S5.547 S5.551G <u>ADD S5.[HDFSS]</u>	41-42 FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile S5.551F <u>MOD</u> S5.547 S5.551G <u>ADD S5.[HDFSS]</u>

47.2–50.2 GHz	
Allocation to Services	
47.2-50.2	FIXED <u>NOC</u> FIXED-SATELLITE (Earth-to-space) S5.552 MOBILE S5.149 S5.340 S5.552A S5.555 <u>ADD S5.[HDFSS]</u>

Reasons: ~~1. The U.S. proposes identification of the following existing FSS frequency bands for HDFSS on a global basis, for the following reasons:~~

- ~~□The bands 29.5-30.0 GHz and 19.7-20.2 GHz are allocated globally to the FSS in the Earth-to-space and space-to-Earth directions, respectively. There is no co-primary FS allocation in the ITU Table of Frequency Allocations in these bands.~~
 - ~~□The bands 28.6-29.1 GHz and 18.8-19.3 GHz are allocated globally to the FSS in the Earth-to-space and space-to-Earth directions, respectively. Furthermore, these are the only bands considered for HDFSS where NGSO FSS systems are not subject to No. S22.2 and therefore represent the best opportunity for ubiquitously deployed NGSO FSS user terminals. In these two bands, some administrations in all Regions have planned for HDFSS and adopted regulatory provisions for terrestrial systems in order to facilitate HDFSS. Some HDFSS systems are already in development in these bands and there are other filings for HDFSS type systems.~~
 - ~~□The bands 18.58-18.8 GHz (space-to-Earth), and 28.35-28.6 GHz and 29.25-29.5 GHz (both Earth-to-space), are also planned for use by many administrations for HDFSS applications.~~
 - ~~□In the 37.5-50.2 GHz range, many administrations have submitted ITU filings for FSS systems in the bands 40.0-42.0 GHz (space-to-Earth) and 48.2-50.2 GHz (Earth-to-space) and propose to use these bands for global HDFSS. WRC-00 advised administrations that may be contemplating HDFSS use of the band 40.5-42 GHz to take into account constraints to HDFSS due to the potential deployment of high-density applications in the FSS. Further, Resolution 84 (WRC-2000) urges administrations considering regulatory provisions relating to the band 40.0-40.5 GHz to take into account that there were a number of proposals to WRC-2000 to identify the band for HDFSS applications. As a consequence of actions at WRC-2000, the 40.5-42.0 GHz band could be identified for HDFSS use through new Radio Regulation S5.[HDFSS], but would also require a modification of existing Radio Regulation No. S5.547 (see proposal USA/xx/3 below).~~
- ~~2. The U.S. proposes specifically that WRC-03 not make additional FSS allocations in the 47.2-50.2 GHz band to accommodate possible HDFSS use. In this regard, as studies have shown that HDFSS uplinks and HDFSS downlinks cannot share the same spectrum, and there are interference concerns about FSS gateway uplinks and HDFSS downlinks, the U.S. proposes no change to the FSS allocation directions in the 47.2-50.2 GHz band. The FSS allocation in this band is to be retained for uplink use only.~~

USA/ 12
ADD

S5.[HDFSS] The space-to-Earth FSS-fixed-satellite service bands 18.58-18.8 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, and 40.0-42.0 GHz and the Earth-to-space FSS-fixed-satellite service bands 28.35-28.6 GHz, 28.6-29.1 GHz, 29.25-29.5 GHz, 29.5-30.0 GHz and 48.2-50.2 GHz, are identified for use by high-density applications in the fixed-satellite service (HDFSS) in accordance with **Resolution [HDFSS] (WRC-03)**. This identification does not preclude-constrain the use of these bands by other FSS-fixed-satellite service applications or by other co-primary services allocated in these bands and does not establish priority among users of the bands in the Radio Regulations. Administrations should take this identification, as well as the use of these bands by other co-primary services and other fixed-satellite service applications, into account when considering national regulatory provisions in relation to these bands.

Reasons: The identification of appropriate frequency bands for high-density applications in the FSS, and the adoption of approved national guidelines to facilitate the deployment of HDFSS earth terminals, can help administrations and HDFSS satellite system operators in such earth station deployment. This footnote will also inform administrations of those specific bands intended for deployment of HDFSS systems in all regions of the world, while specifying that the use of these bands for HDFSS applications does not constrain their use by other co-primary services or by other FSS applications.

USA/xx/3
MOD

S5.547 The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolutions **75 (WRC-2000)** and **79 (WRC-2000)**). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because the band 40.5-42 GHz is identified for use by high-density applications in the fixed satellite service (see No. S5.[HDFSS] and Resolution [HDFSS] (WRC-03)), and thus is available for these applications, ~~Because of the potential deployment of high-density applications in the fixed satellite service in the bands 39.5-40 GHz and 40.5-42 GHz,~~ administrations should further take into account ~~potential~~ appropriate constraints to high-density applications in the fixed service when considering regulatory provisions in relation to the latter type of applications in the same band, as appropriate [(see Resolution **84 (WRC-2000)**)].

Reasons: Consequential to the addition of No. S5.[HDFSS] to the 40.5-42.0 GHz band, and the non-identification of 39.5-40.0 GHz for HDFSS use. *NOTE: The square brackets reflect that the fate of Resolution 84 has not yet been determined.*

USA/xx/4
ADD

RESOLUTION [HDFSS] (WRC-03)

National Implementation of High-Density Applications in the Fixed Satellite Service in Frequency Bands Identified for HDFSS

The World Radiocommunication Conference (Caracas, 2003),

considering

- a) that demand has been increasing steadily for broadband communications services throughout the world;
- b) that this demand for ubiquitous broadband communications services can be met in part through the use of high-density applications in the fixed-satellite service (HDFSS);
- c) that HDFSS is an advanced broadband communications applications concept that enables telecommunications services to be provided on a flexible, wide-scale basis through standardized, relatively low-cost earth terminal equipment;

- d) that HDFSS will provide users with access to a wide range of broadband telecommunications services supported by fixed telecommunications networks (including the Internet) and thus will complement other telecommunications systems;
- e) that HDFSS offers great potential for developing countries to establish their telecommunications infrastructure more rapidly;
- f) that HDFSS systems are characterized by flexible, rapid deployment, high frequency reuse, and ubiquitous deployment of large numbers of “typical” Earth stations employing small antennas having common technical characteristics;
- ~~g) that HDFSS Earth stations should not be subject to major cost and complexity implications in consideration of the large number and nature of terminals involved;~~

noting

- a) that No. **S5.[HDFSS]** identifies the space-to-Earth FSS bands 18.58-18.8 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, and 40.0-42.0 GHz and the Earth-to-space FSS bands 28.35-28.6 GHz, 28.6-29.1 GHz, 29.25-29.5 GHz, 29.5-30.0 GHz and 48.2-50.2 GHz, for high-density applications in the fixed satellite service (HDFSS);
- b) that in some of the bands listed in *noting a)* above, the FSS allocations are co-primary with fixed and mobile service allocations;
- c) that this identification does not constrain the use of these bands by other co-primary services or by other fixed-satellite service applications, and does not establish priority among users of the bands in the Radio Regulations;
- d) that in the band 18.6-18.8 GHz, the FSS allocation is co-primary with the Earth exploration-satellite service (passive) with the restrictions of **S5.522A** and **S5.522B**.
- e) that radio astronomy observations of an important spectral line are carried out in the 48.94-49.04 GHz portion of the 47.2-50.2 GHz band, and that they require continued worldwide protection;
- ~~e)f)~~ that a number of FSS systems with other types of earth stations and characteristics have already been brought into use or are planned to be brought into use in some of the frequency bands identified for HDFSS in No. **S5.[HDFSS]**;
- ~~d)g)~~ that HDFSS stations in these bands are expected to be deployed in large numbers over urban, suburban and rural areas of large geographical extent;
- ~~e)h)~~ that harmonized worldwide bands for HDFSS would facilitate the implementation of HDFSS and maximize the extent to which users in administrations around the world would be able to benefit from global access and economies of scale,

recognizing

- a) that as a consequence of their general characteristics, it is not practicable to coordinate HDFSS Earth stations with fixed service stations on an individual site-by-site basis;
- b) that the single authorization of a large number of FSS earth stations associated with a given satellite system, without the need for individual site coordination, would greatly facilitate the ability of fixed-satellite services to reach large numbers of users within a geographic area;
- c) that such an authorization would minimize the administrative burden for administrations to individually authorize a large number of earth stations,

recognizing further

- a) that FSS networks and systems implementing HDFSS applications are subject to all applicable provisions of the Radio Regulations, such as coordination and notification pursuant to Articles **S9**

and **S11**, including any ITU requirements to coordinate with fixed service networks across international borders, and limits in Articles **S21** and **S22**;

- b) that Article **S21** contains power flux density limits that protect ~~FS-fixed service~~ receivers operating in the ~~FSS-fixed-satellite service~~ space-to-Earth bands identified in No. **S5.[HDFSS]** that are co-primary with the fixed service, thereby insuring that transmissions from ~~FSS-fixed-satellite service~~ satellites will not cause interference to ~~FS-fixed service~~ receivers operating in these same bands;

resolves

to urge administrations implementing HDFSS in some or all of the corresponding frequency bands in No. **S5.[HDFSS]** to consider:

- a) using a single authorization for a large number of “typical” earth stations having ~~similar~~ common technical characteristics and associated with a given satellite system;
- b) ~~take-taking~~ into account the relevant international technical characteristics, as identified by ITU-R Recommendations (e.g., Recommendations ITU-R S.524-7 and [doc. 4/70]);
- c) ~~take-taking~~ into account that continued assignment of spectrum to or deployment of terrestrial stations in bands identified for HDFSS within the same geographical area could impede the introduction or development of HDFSS and reduce or eliminate the benefits that such applications offer;
- d) ~~ensure-ensuring~~ compatibility with other existing and planned ~~FSSfixed-satellite service operations-systems~~ having different characteristics, particularly those that use the frequency band 17.8-21.2 GHz (space-to-Earth),

invites administrations

to give due consideration to the benefits of harmonized utilization of the spectrum for HDFSS on a global basis, taking into account the use and planned use of these bands by all other services to which these bands are allocated, as well as other types of fixed-satellite service applications.

Reasons: Many administrations are currently in the process of determining how to appropriately provide for HDFSS services in their countries. Some of these administrations are looking to the ITU for guidance on spectrum management issues concerning the FS and HDFSS and this Resolution provides that guidance.
